

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-38. (Canceled)

39. (Currently Amended) A data carrier comprising:

a hologram storing data to reproduce an image of a portion of a human body characteristic of an individual, said hologram storing additional data; and

a second data bearing device; and

wherein data stored by said second data bearing device is verifiable using data stored in said hologram and comprises:

first and second data, said first data being for verification of one of said first data and said image with the other, and the second data being verified by said verification; and

third and fourth data, said third data being for verification of one of said additional data and said third data with the other, and the fourth data being verified by said verification.

40. (Canceled)

41. (Canceled)

42. (Previously Presented) A data carrier as claimed in claim 39 wherein said image comprises a substantially two-dimensional image.

43. (Previously Presented) A data carrier as claimed in claim 39 wherein said hologram comprises a volume reflection hologram.

44. (Previously Presented) A data carrier as claimed in claim 39 wherein said second data bearing device comprises an integrated circuit memory device.

45. (Withdrawn) A method of verifying data stored on a data carrier, the data carrier comprising:

a hologram storing data to reproduce an image of a portion of a human body characteristic of an individual; and

a second data bearing device; and

wherein data stored by said second data bearing device is verifiable using data stored in said hologram, the method comprising:

reproducing said characteristic image;

comparing said reproduced image with a view of an individual to verify data stored in said hologram;

verifying, responsive to a result of said comparison, data stored by said second data bearing device using data stored in said hologram.

46. (Withdrawn) Apparatus for capturing and recording an image such as a biometric image as a hologram for a data carrier, the apparatus comprising:

a biometric image capture device;

means for electronically reproducing said captured image as a reproduced image; and

means for recording said reproduced image in a holographic recording material for developing into a hologram.

47. (Withdrawn) Apparatus as claimed in claim 46 wherein said reproduced image is substantially planar.

48. (Withdrawn) Apparatus as claimed in claim 47 comprising means to record for said hologram a first view comprising said reproduced image and a second view comprising additional data.

49. (Withdrawn) Apparatus as claimed in claim 47 wherein said hologram comprises a volume reflection hologram or volume transmission hologram.

50. (Withdrawn) Apparatus as claimed in claim 46 further comprising means for storing said captured image in a data store for comparison with said recorded image.

51. (Currently Amended) A data carrier comprising:

a volume reflection hologram storing data to reproduce an image of a graphic associated with a product; and

a second data bearing device storing data unique to the data carrier that is verifiable by the volume reflection hologram, the data comprising:

first and second data, said first data being for verification of one of said first data and said image with the other, and the second data being verified by said verification; and
third and fourth data, said third data being for verification of one of said additional data and said third data with the other, and the fourth data being verified by said verification.

52. (Previously Presented) A data carrier as claimed in claim 51 wherein said data carrier is substantially planar and wherein said graphic image is spaced away from the plane of said data carrier.

53. (Previously Presented) A data carrier as claimed in claim 51 wherein said second data bearing device comprises a unique, machine-readable code.

54. (Previously Presented) A data carrier as claimed in claim 51 wherein said data carrier is substantially planar and wherein said second data bearing device defines an image spaced away from the plane of said data carrier and comprising said unique data.

55. (Withdrawn) Recording apparatus for recording a hologram for a data carrier, the apparatus comprising a spatial light modulator (SLM) in mechanical contact with a holographic recording medium.

56. (Withdrawn) Recording apparatus for recording a hologram for a data carrier, the apparatus comprising a spatial light modulator (SLM), a holographic recording medium, and an optically transparent spacer between the holographic recording medium and the SLM.

57. (Withdrawn) Recording apparatus as claimed in claim 56 wherein said spacer has a thickness of less than 3cm, preferably less than 1cm.

58. (Withdrawn) Recording apparatus as claimed in claim 56 further comprising a laser to record said hologram.

59. (Withdrawn) Recording apparatus as claimed in claim 58 wherein said spacer has a thickness less than a coherence length of said laser.

60. (Withdrawn) Recording apparatus as claimed in claim 58 further comprising a diffuser, and wherein said laser is configured to illuminate said SLM through said diffuser.

61. (Withdrawn) Apparatus for capturing and recording an image, the apparatus comprising:

an image capture device;

a spatial light modulator to reproduce a substantially two-dimensional version of the captured image; and

a holographic writer to write the reproduced image into a hologram.

62. (Withdrawn) Apparatus as claimed in claim 61 wherein said image is written as a reflection hologram.

63. (Withdrawn) Apparatus as claimed in claim 61 wherein said spatial light modulator is in close proximity to or adjacent said holographic recording medium.

64. (Withdrawn) Apparatus as claimed in claim 61 further comprising a diffuser in an objector reference beam of said holographic writer to create a hologram with a diffused or speckled appearance.

65. (Withdrawn) A method for creating a data carrier incorporating a hologram and a second data bearing device, the method comprising:

capturing biometric information and using this to create an image;

recording the image into a hologram; and

recording data derived from or verifiable using data stored in the hologram on said second data bearing device.

66. (Withdrawn) A method as claimed in claim 65 wherein said image is substantially two-dimensional.

67. (Withdrawn) A method as claimed in claim 65 wherein said second data bearing device comprises a semi-conductor memory device.

68. (Withdrawn) A method as claimed in claim 65 wherein said memory device stores a version of the image and cryptographic data which is also written into the hologram.

69. (Withdrawn) A method as claimed in claim 65 wherein said data is stored as a reflective hologram.

70. (Withdrawn) A method as claimed in claim 67 wherein said memory device and said hologram are bonded to a common substrate or encapsulated in a single document or card.

71. (Withdrawn) A data carrier carrying processor control code to implement the method of claim 65.

72. (Withdrawn) Apparatus for verifying data stored on a data carrier, the data carrier comprising a hologram storing data to reproduce an image of a portion of a human body characteristic of an individual and a second data bearing device, and wherein data stored by said second data bearing device is verifiable using data stored in said hologram, the apparatus comprising:

means to reproduce said characteristic image;

means to compare said reproduced image with a view of an individual to verify data stored in said hologram;

means to verify, responsive to a result of said comparison, data stored by said second data bearing device using data stored in said hologram.

73. (Withdrawn) Apparatus for reading a data carrier carrying a hologram, the apparatus comprising:

at least one light source for illuminating the hologram, said at least one light source being configured to deliver light at a specific angle to the surface of said hologram to reconstruct a holographic image in an image plane spaced away from a plane of said data carrier; and

an imaging device focused in the plane of said holographic image, said imaging device having a sufficiently small depth of field as to substantially visually separate said plane of said holographic image from said plane of said data carrier.

74. (Previously Presented) A data carrier as claimed in claim 39 wherein said hologram is configured to reconstruct in a plurality of component colors.

75. (Previously Presented) A data carrier as claimed in claim 74 wherein said plurality of component colors comprise false colors configured to aid identification.

76. (Previously Presented) A data carrier as claimed in claim 74 wherein at least one of said component colors is substantially invisible to the human eye.

77. (Previously Presented) A data carrier as claimed in claim 51 wherein said hologram is configured to reconstruct in a plurality of component colors.

78. (Previously Presented) A data carrier as claimed in claim 77 wherein said plurality of component colors comprise false colors configured to aid identification.

79. (Previously Presented) A data carrier as claimed in claim 77 wherein at least one of said component colors is substantially invisible to the human eye.